ADDENDUM TO THE CONTRACT
for the

MENDENHALL WASTEWATER TREATMENT PLANT
BIOSOLIDS DRYER FACILITY

Contract No. BE17-133

ADDENDUM NO.: **SEVEN** **CURRENT DEADLINE FOR BIDS:** **July 11, 2017**

PREVIOUS ADDENDA: **SIX**

ISSUED BY: City and Borough of Juneau
ENGINEERING DEPARTMENT
155 South Seward Street
Juneau, Alaska 99801

DATE ADDENDUM ISSUED: **July 5, 2017**

The following items of the contract are modified as herein indicated. All other items remain the same. This is a faxed addendum. A confirming copy will not be mailed to you. This addendum has been issued and is posted online. Please refer to the CBJ Engineering Contracts Division webpage at: http://www.juneau.org/engineering_ftp/contracts/Contracts.php

INFORMATION ITEMS:

The deadline for submitting bidder questions has expired June 20, 2017. No further questions will be accepted.

PROJECT MANUAL:

Item No. 1 SECTION 00500 – AGREEMENT, ARTICLE 2 – CONTRACT COMPLETION TIME. ***Change*** the substantial completion date ***from*** October 1, 2018, ***to*** November 19, 2018. ***Change*** the Final Completion date ***from*** October 29, 2018, ***to*** December 17, 2018.

Item No. 2 SECTION 00800 – SUPPLEMENTARY GENERAL CONDITIONS, SGC 14.3 – APPLICATION FOR PROGRESS PAYMENT, Paragraph A. ***Add*** the following subparagraph 1.

"1. Submission of updated Certified Payrolls, Construction Schedule, and Record Drawings must accompany each Application for Progress Payment. If Owner deems supporting documentation incomplete or non-compliant, then Owner may withhold some or all of progress payment request until acceptable supporting documentation is provided by the Contractor."

Item No. 3 SECTION 011000 – SUMMARY, PART 1 – GENERAL, Article 1.5 – CONSTRUCTION PERIOD, Paragraphs 2 and 3. ***Delete*** and ***replace*** with the following:

"2. The WORK shall be Substantially Complete November 19, 2018.

3. Final Completion of the WORK shall occur on or before December 17, 2018. WORK occurring after this date shall be coordinated with OWNER's use of the facility and may be required to occur after normal business hours."

Item No. 4 SECTION 051200 – STRUCTURAL STEEL FRAMING, PART 2 – PRODUCTS, Article 2.10 – QUALITY ASSURANCE, Paragraph A – Fabricator Qualifications. ***Delete*** and ***replace*** with the following:

"A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD. In lieu of participation in the AISC Quality Certification Program the Contractor can provide independent third party special inspections of shop fabrication that demonstrates compliance with AISC procedures and quality control. Independent third-party inspections must be by a qualified licensed engineer."

Item No. 5 SECTION 051200 – STRUCTURAL STEEL FRAMING, PART 2 – PRODUCTS, Article 2.10 – QUALITY ASSURANCE, Paragraph B. ***Delete*** in its entirety.

Item No. 6 SECTION 230900 – INSTRUMENTATION AND CONTROL FOR HVAC. ***Delete*** in its entirety, and ***replace*** with the attached SECTION 230900 – INSTRUMENTATION AND CONTROL FOR HVAC, labeled Addendum No. 7.

DRAWINGS:

Item No. 7 ***Add*** Sheets SB5-06A – STRUCTURAL DETAILS – IPS ODOR CONTROL PLATFORM, SB5-06B – STRUCTURAL DETAILS – IPS ODOR CONTROL SUPPORTS, AND SB6-06C – STRUCTURAL DETAILS – IPS ODOR CONTROL MISC.

Item No. 8 SHEET MH6-03 – HVAC EQUIPMENT SCHEDULES 3. ***Remove*** Revision 3 dated 5/24/2017 and ***replace*** with Revision 4 dated 7/5/2017.

Item No. 9 SHEET O1-03 – ODOR CONTROL INFLUENT PUMP STATION PLAN. ***Remove*** Revision 3 dated 5/24/2017 and ***replace*** with Revision 4 dated 7/5/2017.

Item No. 10 SHEET O3-02 – ODOR CONTROL SECTIONS 2. ***Remove*** Revision 3 dated 5/24/2017 and ***replace*** with Revision 4 dated 7/5/2017.

Item No. 11 SHEET O5-01 – ODOR CONTROL DETAILS. ***Remove*** Revision 3 dated 5/24/2017 and ***replace*** with Revision 4 dated 7/5/2017.

Item No. 12 SHEET O6-01 – ODOR CONTROL EQUIPMENT SCHEDULES. ***Remove*** Revision 3 dated 5/24/2017 and ***replace*** with Revision 4 dated 7/5/2017.

Item No. 13 SHEET O6-04 – ODOR CONTROL INFLUENT PUMP STATION P&ID. ***Remove*** Revision 3 dated 5/24/2017 and ***replace*** with Revision 4 dated 7/5/2017.

By: 

Greg Smith,
Contract Administrator

Total number of pages contained within this Addendum: 31

SECTION 23 09 00 – INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section Includes:

1. Provisions for the materials, installation, and testing of instrumentation and controls for HVAC systems, in addition to descriptions of HVAC systems operation.
2. Temperature Control Devices
3. Pressure Control Devices
4. Miscellaneous Control Devices
5. Temperature Control Valves
6. Motorized Dampers

1.2 RELATED SPECIFICATIONS

A. Division 00 - Bidding Requirements, Contract Forms, and Conditions of the Contract.

B. Division 01 - General Requirements.

1. Section 01 33 00 – Submittal Procedures
2. Section 01 78 23 - Operation and Maintenance Data

C. Division 23 – Heating, Ventilation and Air Conditioning (HVAC)

1. Section 23 21 23 - Hydronic System Pumps
2. Section 23 33 00 - Air Duct Accessories
3. Section 23 34 00 - HVAC Fans
4. Section 23 37 00 - Air Outlets and Inlets
5. Section 23 81 00 - Decentralized Unitary HVAC Equipment
6. Section 23 82 00 - Convection Heating Units

D. Division 44 – Air Pollution Control

1. Section 44 31 34 Centrifugal FRP Fans

1.3 REFERENCE STANDARDS

A. The WORK of this Section shall comply with the current editions of the following codes as adopted by the City and Borough of Juneau Municipal Code.

1. International Mechanical Code
2. National Electrical Code

B. American National Standards Institute (ANSI/FCI)

1. ANSI/FCI 70-2 – Control Valve Seat Leakage

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.5 – Pipe Flanges and Flanged Fittings
2. ASME B16.34 – Valves-Flanged, Threaded, and Welding End
3. ASME B16.1 – Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800

D. International Society for Automation (ISA)

1. ISA S75.02 – Control Valve Capacity Test Procedure

E. National Electrical Manufacturers Association (NEMA)

1. NEMA ICS 2 – Industrial Control Devices, Controllers, and Assemblies

F. National Fire Protection Association (NFPA)

1. NFPA 70 – National Electric Code
2. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems
3. NFPA 90B - Standard for Installation of Warm Air Heating and Air Conditioning Systems

G. Underwriters Laboratories (UL)

1. UL 429 – Electrically Operated Valves

1.4 SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Action Submittals – Require ENGINEER'S responsive action.

1. A copy of this Section, addendum updates included, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations.
2. Manufacturer's literature for each type of panel, controller or device shown on the Riser Diagram.
3. Riser Diagram showing, schematically, the entire building system with all major components identified.
4. A written description of all control sequences of equipment operation.
5. Systems points list.
6. All operations and maintenance information specified in Section 01 78 23 – Operation and Maintenance Data.

PART 2 - PRODUCTS

2.1 GENERAL

A. The temperature control systems shall be complete, integrated, and automatic electric/electronic type. Control systems shall be 24-volt. Provide power for all control components from nearest electrical panel or as indicated on the Drawings. Control systems

shall include all necessary components, transformers, accessories, wiring and conduits to provide complete and automatic systems ready for full time operation.

1. System shall include heating, ventilation, and air conditioning controls to automatically start and stop air conditioning units, air handling units and exhaust systems. The system shall provide space heating and cooling sensing and control valve assemblies to maintain space temperatures as indicated on the Drawings, provide control of outside air, return air and bypass duct motorized dampers in order to utilize economizer cycle cooling effect. The temperature controls shall automatically cause the system to operate in cooling mode whenever any zone requires cooling which cannot be accommodated by the operation economizer mode.
2. Heating and ventilation systems in buildings and structures shall utilize economizer cycle cooling where indicated, and shall utilize air handling units and the heating types indicated on the Drawings to provide heating. All heating and cooling shall be thermostat controlled.
3. The 2- or 3-way control valves for heating hot water systems shall be sized for Cv as specified or for pressure drop of approximately 5 psi at the design flow.

B. Provide equipment manufacturer's controls where specified with the equipment.

C. Refer to the Drawings and the General Sequence of Operations at the end of this Section for details of each system and required interfaces with the SCADA system, when specified. Temperature control diagrams may not be indicated for all required systems.

2.2 CONTROL PANELS

A. Control Panels:

1. Enclosures may be NEMA 1 when located in a clean, dry, indoor environment. Indoor enclosures to be NEMA 12 when installed in other than a clean environment. Outdoor enclosures must be NEMA 3R. Provide (hinged door) key-lock latch and removable subpanels. Single key common to field panels and subpanels. In existing campus or building settings, key lock to match existing keys.
2. Power shall be 120 VAC. The control system shall contain all necessary transformers, relays, etc. to provide 24 VAC power for control components.
3. Interconnections between internal and face-mounted devices prewired with color-coded stranded conductors neatly installed in plastic troughs and/or tie-wrapped. Terminals for field connections UL listed for 600-volt service, individually identified per control/interlock drawings, with adequate clearance for field wiring. Control terminations for field connection individually identified per control drawings.
4. Provide ON/OFF power switch with overcurrent protection for control power sources to each local panel.
5. Provide laminated plastic nameplates for enclosures in any mechanical room or electrical room labeled with TCP number. Laminated plastic to be 1/8-inch thick sized appropriately to make label easy to read.

6. Provide control panels as part of this Section with the following:

    a. ON/OFF or HAND/OFF/AUTO switches for all equipment controlled by panel.
    b. 24 VDC run signal output to interface with Division 26 motor starters or MCCs for equipment start and stop circuiting.
    c. 24 VDC output for general fault alarm to SCADA.
    d. 24 VAC power and 0-10 VDC control to 3-way temperature control valves.

7. In addition, control panels shall include the following status and alarm indication lights.

    a. Equipment run indication status lights
    b. Equipment unit dirty filter status lights
    c. Equipment low differential pressure alarm lights
    d. Equipment fault alarm lights

8. Low differential pressure and equipment fault alarm conditions shall produce a general fault alarm that is sent from the control panel to SCADA.

2.3 TEMPERATURE CONTROL DEVICES

A. Temperature Sensors:

1. General:

    a. All temperature sensors to be solid-state electronic, factory calibrated to a tolerance within one-half degree F, totally interchangeable. Wall sensors to be housed in enclosure appropriate for application. Duct and well sensors to be electronically identical with housing appropriate for application. Provide appropriate wells for installation by others.
    b. Provide digital display zone sensor for all wall sensors unless indicated otherwise on Drawings.

2. Duct-Mounted Temperature Sensors: Thermistor or platinum RTD element with accuracy of ±0.5 degrees F at 32 degrees F, consisting of single point sensing elements, securely mounted in duct or plenum; operating range 20 to 120 degrees F; linear signal; 24-inch rigid probe. Use where duct is less than 9 SF cross sectional area.
3. Outside Air Temperature Sensor: Thermistor or platinum RTD element with accuracy of ±0.5 degrees F at 32 degrees F; Range -58 to 120 degrees F, single element, linear, with weather and sun shield for exterior mounting.

B. Thermostats:

1. Provide thermostats where shown on the Drawings, and for all equipment identified as thermostat-controlled. Thermostats shall be wall-mounted and have a minimum 40 to 90°F temperature range. Provide thermostats meeting the following requirements unless noted otherwise on the Drawings or in the Specifications.

    a. Programmable thermostats shall be provided in finished areas. Thermostats shall be digital programmable with 7 different day types and capable of night setback. Thermostats shall have fan Auto-On switch and system Off-Heat-Auto-Cool and

manual temperature settings. Thermostats shall be capable of a 5-degree minimum deadband.

b. Low-voltage or line-voltage thermostats shall be provided in unfinished areas. Thermostats shall include an integral room thermometer.
c. Thermostats integral with the equipment shall be provided where indicated.

2. Freeze Protection Thermostat: Electric low temperature thermostats shall have 20-feet averaging bulbs installed to cover the entire duct or coil area. Location of thermostats shall be downstream of heating coil. Thermostats shall be two-position with manual reset. Low temperature safety shall be provided with a timed bypass to permit cold weather start-up. The thermostat shall only be bypassed when the timer is timing. The timer shall be adjustable from 0 to 5 minutes.

2.4 PRESSURE CONTROL DEVICES

A. General:

1. Sensor have linear output signal; field adjustable zero and span. Sensing elements withstand continuous operating conditions of positive or negative pressure 50 percent greater than calibrated span without damage.

B. Differential Pressure Switch:

1. Set point adjustable with operating range of 0.5- to 12-inch WG for fans, and 5 to 30 feet WC for pumps. Switches UL listed; DPDT snap-acting rated for 0.5 Amps at 120 VAC; enclosure as required for location; scale range and differential suitable for intended application.

C. Filter Differential Pressure Switch

1. Set point adjustable with operating range of 0.1- to 5-inch WG; auto reset. Contactor to close when pressure differential setting is met or exceeded. Provide mounting bracket, metallic tubing and appropriate fittings for connection to duct or air-handling unit.

2.5 MISCELLANEOUS CONTROL DEVICES

A. Duct Mounted Smoke Detector:

1. Duct mounted smoke detector shall be the photoelectric type that complies with NFPA 72 and includes the following features:

a. Auxiliary SPDT relay contact.
b. Key-operated normal-reset-test switch.
c. Duct sampling tubes extending width of duct.
d. Visual indication of detector actuation.
e. Duct-mounted housing

2. Furnish four-wire detector with separate power supply and signal circuits.
3. Manufacturer’s shall be United Technologies; Honeywell International; Siemens Building Technology; or Approved Equal.

B. Temperature Control Valves

1. Temperature control valves shall be globe-pattern, three-way, stem-guided, throttling (modulating) type mixing valves with Class IV leakage per ANSI/FCI 70 2. Valve shall be process quality and shall be designed for continuous modulating service of hot water with temperatures up to 210 degrees Fahrenheit. Valve end connections shall be flanged and shall comply with ASME B16.5 Class 150 flanges. Body and bonnet material shall be ASTM A216 Carbon Steel or Cast Iron; Trim and throttling plug material shall be Type 316 stainless steel; and packing material shall be Teflon.

   a. Manufacturers shall be Fisher YS; Masoneilan 8000; or Approved Equal.

2. Actuators

   a. Actuators shall be the electric motor, ~~multi~~**linear**-turn, throttling type ~~(EMTT)~~. Controller shall consist of a solid-state electronic, servo-amplifier comparator and an electro-mechanical reversing starter. The controller shall accept an external 4 to 20 mA DC isolated position input signal into a maximum load of 250 ohms.
   b. Provide a current position transmitter providing an internally fed 4-20 mA signal proportional to the valve position. The current position transmitter shall be selectable for minimum signal corresponding to fully closed or fully open position with automatic zero and span setting. The maximum external impedance that may be connected to the signal shall be 500 ohms at nominal supply voltage. Repeatability shall be within +/- 1 percent and linearity shall be within +/- 1 percent of total valve travel.
   c. Capable of 1,200 starts per hour.
   d. Controller shall compare the commanded position with the actual position to produce an error signal. The controller shall cause the motor to move the valve or gate in a direction so as to reduce the magnitude of the error signal. The controller positioning accuracy shall be +/- 1.0 percent of travel, or better.
   e. Provide remote control station that includes LOCAL, REMOTE, STOP, OPEN and CLOSE controls through selector switches and/or pushbuttons.
   f. Manufacturers shall be Rotork ~~IQM~~ **IQML**; or Approved Equal.

3. See Temperature Control Valves Schedule on the Drawings for specific requirements.

C. Motorized Dampers

1. Motorized dampers shall be low-leakage design constructed of galvanized steel, extruded aluminum or stainless steel as required, and configured for installation as shown on the Drawings. Blades shall be parallel opening and shall be provided with felt, vinyl, polyurethane or neoprene edge seals mechanically locked into blade edge. Minimum 4-inch channel type frames with flanges to facilitate mounting. Bearings shall be corrosion resistant synthetic and linkage shall be concealed in frame. Where specified, corrosion-resistant, factory applied coatings shall be Heresite applied in strict conformance with the paint manufacturer's instructions. Dampers shall be configured for internal actuator mounting.

   a. Manufacturers shall be Greenheck; Ruskin; or Approved Equal.

2. Damper actuators shall be internal mount type, 24 VAC, Actuator shall be sized to provide operation of damper through full range of motion in a maximum of 40 seconds.

    a. Manufacturer shall be Ruskin; Honeywell; or Approved Equal.

D. See Motorized Damper Schedule on the Drawings for specific requirements.

2.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in the manufacture of control equipment, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firms specializing and experienced in control system installation for not less than 5 years.

C. Responsibility: The supplier of the control systems shall be responsible for inspection and Quality Assurance (QA) for all materials and workmanship furnished.

2.7 PERFORMANCE REQUIREMENTS

A. Furnish all labor, materials, equipment, services and incidentals required to provide complete, integrated, and operating HVAC control system for the buildings and equipment in the PROJECT.

B. Provide all necessary hardware and software to meet the specified functional requirements.

C. Prepare individual hardware layouts, interconnection drawings and control loop configuration data from PROJECT design data.

D. Implement the detailed design for all system input/output points, distributed control and system data bases, graphic displays, logs, and management reports based on control descriptions, logic drawings, and configuration data.

E. Provide and install all interconnecting conduit and cables between supplied cabinets, instruments, controllers, controlled equipment and output devices.

F. Provide supervisory specialists and technicians at the job site to assist in all phases of system installation, startup and commissioning.

G. Provide a comprehensive operator and technician training program as described herein.

H. Provide as-built documentation, software, all control logic and all associated support documentation on approved media that accurately represents the final system.

I. Extent of controls systems WORK required by this Section is indicated on Drawings, Schedules, and by requirements of this Section.

J. The Electrical Contractor shall provide:

1. Power supply wiring from power source to power connection on controls and/or equipment, and variable air volume system components. Include providing starters, disconnects, relays and required electrical devices, except where specified as furnished in schedules or specifications, or factory-installed by manufacturer.
2. Control wiring and conduit between control panel and Division 26 motor starters or MCC.
3. Control wiring and conduit between HVAC controls panels, instrumentation and SCADA.

K. The HVAC Controls Contractor shall provide:

1. Disconnect switches for all 120 VAC equipment, unless furnished with the equipment.
2. Interlock conduit and wiring between electrically operated equipment and between equipment and field-installed control devices.
3. Provide interlock conduit and wiring specified as factory installed.
4. Provide control conduit and wiring between field-installed controls, indicating devices, and equipment control panels.
5. Interface all controls with all manufacturer-supplied equipment.
6. Comply with requirements of Division 26.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting WORK, carefully inspect installed work of other trades and verify that such work is complete to the point where WORK of this Section may properly commence.

B. Notify the OWNER in writing of conditions detrimental to the proper and timely completion of the WORK.

C. Do not begin WORK until unsatisfactory conditions are resolved.

3.2 INSTALLATION

A. Control Systems Installation:

1. Install in accordance with manufacturer's instructions.
2. Provide all miscellaneous devices, hardware, software, interconnections, installation, and programming required for a complete operating system in accordance with the sequences of operation and point schedules.
3. Install electrical components and use electrical products complying with applicable requirements of Division 26. Install controllers at convenient locations and heights.
4. Control Wiring: The term "control wiring" is defined to include providing of wire, conduit, and miscellaneous materials as required for mounting and connecting electric control devices.
5. Wiring System: Install complete wiring system for electric control systems. Conceal wiring except in Mechanical Rooms and areas where other conduit and piping are exposed. Provide multi-conductor instruments harness (bundle) in place of single conductors where number of conductors can be run along common path. Fasten flexible

conductors bridging cabinets and doors neatly along hinge side and protect against abrasion. Tie and support conductors neatly.

6. Number-code or color-code conductors, excluding those used for local individual room controls, appropriately for future identification and servicing of control system.
7. Unit-Mounted Equipment: Where control devices are indicated to be unit-mounted, ship electric relays, electric switches, valves, dampers, and damper motors to unit manufacturer for mounting and wiring at factory.
8. Location and Installation of Components:

    a. Locate and install components for easy accessibility. In general, mount 60 inches above floor with minimum 3'-0" clear access space in front of units. Obtain OWNER'S approval on locations prior to installation.
    b. All instruments, switches, and transmitters shall be suitably wired and mounted to protect them from vibration and high temperatures.
    c. Identify all equipment and panels. Provide permanently mounted tags to all panels.
    d. Provide stainless steel or brass thermowells suitable for respective application and for installation under other sections, sized to suit pipe diameter without restricting flow.

9. Interlocking and Control Wiring:

    a. Provide all interlock and control wiring. All wiring shall be installed in a neat and professional manner in accordance with Division 26 and all state and local electrical codes.
    b. Provide wiring as required by functions as specified and as recommended by equipment manufacturers, to serve specified control functions.
    c. Control wiring shall not be installed in power circuit raceways. Magnetic starters and disconnect switches shall not be used as junction boxes. Provide auxiliary junction boxes as required. Coordinate location and arrangement of all control equipment with the OWNER prior to rough-in.
    d. Provide auxiliary pilot duty relays on motor starters as required for control function.

3.3 TESTING, TRAINING AND COMMISSIONING

A. The equipment and controls of this Section shall be completely tested, adjusted and placed in operating condition. Perform operations and checks of equipment and controls in accordance with Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC before units are operated for any purpose.

B. Retest equipment and controls, as necessary, during the progress of the WORK. No WORK shall be covered until it is properly tested and made tight.

C. Supply the testing apparatus and make all necessary connections for applying the tests.

D. When about to turn the apparatus over to the OWNER, put all parts of the apparatus in perfect working order and thoroughly clean out all parts of the equipment.

E. Field Services:

1. Startup: Start up, test and adjust electric control systems in presence of manufacturer's authorized representative. Demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
2. Final adjustment: After completion of installation, adjust thermostats, control valves, motors, and similar equipment provided as WORK of this Section. Final adjustment shall be performed by specially trained personnel in direct employ of the manufacturer of primary temperature control system.
3. Startup and commission systems: Allow sufficient time for startup and commissioning prior to placing control systems in permanent operation.

F. Training:

1. Demonstrate complete and operating system to OWNER. Provide application engineer to instruct OWNER in operation of systems and equipment.
2. Provide basic operator training for a minimum of three persons on data display, alarm and status descriptors, requesting data, execution of commands, and request of logs.

3.4 DESCRIPTION OF SYSTEM OPERATIONS

A. Biosolids Building HVAC Systems

1. Dryer Room 101:

a. System Description: The system consists of a supply fan, hot water heating coil, and a foul air exhaust fan. Outside air is supplied to and exhausted from the space at a rate of 3 air changes per hour. The hot water heating coil provides heating; its corresponding temperature control valve is controlled by a duct-mounted temperature sensor. The Dryer Room 101 heating and ventilation system is controlled from the Biosolids Building Process Area HVAC Control Panel. There are two electric unit heaters located near the roll-up doors for perimeter space heating.
b. Equipment:

Equipment Description	Equipment No.
Biosolids Building Process Area HVAC Control Panel	HPNL-171
Dryer Room 101 Motorized Damper	MD-152
Dryer Room 101 Supply Fan	F-102
Dryer Room 101 Hot Water Coil	HWC-122
Dryer Room 101 Temperature Control Valve	TCV-182
Dryer Room 101 Foul Air Fan	F-312
Dryer Room 101 Electric Unit Heater 1	EUH-133
Dryer Room 101 Electric Unit Heater 2	EUH-134

c. F-102, MD-152, TCV-182, and F-312 Operation:

1) Both F-102 and F-312 are controlled by a single HAND/OFF/AUTO switch located in HPNL-171. The system operates through its HAND/OFF/AUTO selector switch in HAND and AUTO position.
2) HAND: With its HAND/OFF/AUTO selector switch in the HAND position, MD-152 is fully open, both F-102 and F-312 operates continuously and bypasses all safety and operating controls.
3) OFF: With its HAND/OFF/AUTO selector switch in the OFF position, the system and all of its components are inoperative and MD-152 is fully closed.
4) AUTO: With its HAND/OFF/AUTO selector switch in the AUTO position, the system shall operate as described in this Section.

a) Normal Operation: Normal operating conditions are MD-152 fully open and F-102 and F-312 operating continuously.
b) Heating Operation: TCV-182 is controlled by a duct-mounted temperature sensor and shall modulate to maintain a supply air temperature set point of 50 degrees F (adjustable).
c) If supply air temperature downstream of HWC-122 falls below 40 degrees Fahrenheit, F-102 and F 312 shut down, MD-152 fully closes, TCV-182 modulates to full flow through coil.
d) If differential pressure switch at F-102 is activated, then F-312 shuts down and MD-152 fully closes.
e) If differential pressure switch at F-312 is activated, then F-102 shuts down and MD-152 fully closes.
f) If duct-mounted smoke detector for F-102 is activated, then F-102 and F-312 shuts down and MD-152 fully closes.
g) If duct-mounted smoke detector for F-312 is activated, then F-102 and F-312 shuts down and MD-152 fully closes.

d. EUH-133 and EUH-134 Operation:

1) The electric unit heaters are controlled by its integral thermostat. The electric unit heaters operate to maintain a set room temperature of 50 degrees Fahrenheit (adjustable).

e. Alarms:

1) F-102 Dirty Filter: Provide a filter differential pressure switch across F-102 filter. Alarm at HPNL-171 when it exceeds set point. Set point shall be as recommended by filter manufacturer.
2) F-102 Low Flow: Provide a differential pressure switch in supply duct where shown on Drawings. When activated, alarm at HPNL-171.
3) F-312 Low Flow: Provide a differential pressure switch in exhaust duct where shown on Drawings. When activated, alarm at HPNL-171.
4) F-102 Duct Smoke: Provide a duct-mounted smoke detector in supply duct where shown on Drawings. When activated, alarm at HPNL-171.
5) F-312 Duct Smoke: Provide duct-mounted smoke detector in foul air duct where shown on Drawings. When activated, alarm at HPNL-171.

6) Trouble Alarm: One common trouble alarm at HPNL 171 shall be transmitted to SCADA. The alarm shall be triggered if any abnormal conditions occurs which shall cause operation problems for HPNL-171 control or monitoring of specified equipment.

2. Thermal Fluid 102:

a. System Description: The system consists of a supply fan, electric duct heater, and an exhaust fan. Outside air is supplied to and exhausted from the space at a rate of 6 air changes per hour. The electric duct heater provides heating. The Thermal Fluid 102 heating and ventilation system is controlled from the Biosolids Building Process Area HVAC Control Panel.

b. Equipment:

Equipment Description	Equipment No.
Biosolids Building Process Area HVAC Control Panel	HPNL-171
Thermal Fluid 102 Motorized Damper 1	MD-153
Thermal Fluid 102 Motorized Damper 2	MD-154
Thermal Fluid 102 Supply Fan	F-103
Thermal Fluid 102 Electric Heating Coil	EHC-123
Thermal Fluid 102 Exhaust Fan	F-104

c. F-103, F-104, MD-153, and MD-154 Operation:

1) Both F-103 and F-104 are controlled by a single ON/OFF switch located in HPNL-171. The system operates through its ON/OFF selector switch in the ON position.
2) OFF: With its ON/OFF selector switch in the OFF position, the system and all of its components are inoperative and MD-153 and MD-154 is fully closed.
3) ON: With its ON/OFF selector switch in the ON position, MD-153 and MD-154 is fully open and F-103 and F-104 operate continuously.

d. EHC-123 Operation:

1) EHC-123 is controlled by a room temperature thermostat. EHC-123 operates to maintain a set room temperature of 50 degrees Fahrenheit (adjustable).

e. Alarms:

1) F-103 Dirty Filter: Provide a filter differential pressure switch across F-103 filter. Alarm at HPNL-171 when it exceeds set point. Set point shall be as recommended by filter manufacturer.
2) Trouble Alarm: Alarm shall be part of trouble alarm specified in this Section, Article 3.4-A-1-e.8.

3. Electrical 103:

   a. System Description: The system consists of a split system heat pump unit with dry bulb economizer, auxiliary electric heat, and a programmable thermostat. The HVAC system provides heating and cooling to Electrical 103.
   b. Equipment:

Equipment Description	Equipment No.
Electrical 103 Evaporator Unit No. 1	EVP-111A
Electrical 103 Heat Pump Unit No. 1	HP-112A
Electrical 103 Evaporator Unit No. 2	EVP-111B
Electrical 103 Heat Pump Unit No. 2	HP-112B

   c. EVP-111A, EVP-111B, HP-112A and HP-112B Operation:

      1) The system is controlled by inputs received from the programmable thermostat. The system operates through the programmable thermostat's HEAT/OFF/COOL/AUTO system setting switch. The unit's supply fan operates through the programmable thermostat's AUTO/ON fan setting switch. The system operates to maintain a set room temperature of 78 degrees Fahrenheit for cooling (adjustable) and 68 degrees Fahrenheit for heating (adjustable).
      2) System Setting Switch:

         a) HEAT: With programmable thermostats system setting switch in the HEAT position, the system activates heating when the room temperature falls below set point. Heating is deactivated when the set room temperature is reached. No cooling is associated with this position.
         b) OFF: When the programmable thermostat's system setting switch is in the OFF position, this system and all of its components are inoperative.
         c) COOL: When the programmable thermostat's system setting switch is in the COOL position, the system activates cooling when the room temperature rises above the set point; Cooling is deactivated when the set room temperature is reached. No heating is associated with this position.
         d) AUTO: When the system setting switch is in the AUTO position, the system activates heating when the room temperature falls below the set point. Heating is deactivated when the set room temperature is reached. The system activates cooling when the temperature rises above the set point. Cooling is deactivated when the set room temperature is reached.

3) Fan Setting Switch:

a) ON: When the programmable thermostat's fan setting switch is in the ON position, the fan runs continuously.
b) AUTO: When the programmable thermostat's fan setting switch is in the AUTO position, the fan runs only when the thermostat calls for heating or cooling.

4. Lab 105 and Office/Control Room 201:

a. System Description: Lab 105 consists of a mini-split system heat pump unit with a programmable thermostat. The space also consists of an electric wall heater, a supply fan with electric duct heater, and a fume hood with exhaust fan. Office/Control Room 201 consists of a mini-split system heat pump unit with a programmable thermostat. The space also consists of an electric wall heater, a supply fan with electric duct heater.

b. Equipment:

Equipment Description	Equipment No.
Biosolids Building Non-Process Area HVAC Control Panel	HPNL-172
Lab 105 Supply Fan	F-107
Lab 105 Fume Hood Exhaust Fan	FH-109
Lab 105 Heat Pump Unit	HP-116
Lab 105 Evaporator Unit	EVP-115
Lab 105 Electric Heating Coil	EHC-125
Lab 105 Electric Wall Heater	EWH-142
Office/Control Room 201 and Lab 105 Motorized Damper 1	MD-157
Lab 105 Fume Hood Motorized Damper	MD-158
Office/Control Room 201 Supply Fan	F-106
Office/Control Room 201 Evaporator Unit	EVP-113
Office/Control Room 201 Heat Pump	HP-114
Office/Control Room 201 Electric Heating Coil	EHC-124
Office/Control Room 201 Electric Wall Heater	EWH-143

c. F-106 Operation:

1) F-106 is controlled by a ON/OFF switch located in HPNL-172. The system operates through its ON/OFF selector switch in ON position.
2) ON: With its ON/OFF selector switch in the ON position, F-106 operates continuously.
3) OFF: With its ON/OFF selector switch in the OFF position, F-106 and all of its components are inoperative. MD-158 is fully closed when F-106 and F-107 switches are in the OFF position.

d. F-107 Operation:

1) F-107 is controlled by a HAND/OFF/AUTO switch located in HPNL-172. The system operates through its HAND/OFF/AUTO selector switch in HAND and AUTO position.
2) HAND: With its HAND/OFF/AUTO selector switch in the HAND position, F-107 operates continuously and bypasses all safety and operating controls.
3) OFF: With its HAND/OFF/AUTO selector switch in the OFF position, the supply fan and all of its components are inoperative. MD-158 is fully closed when F-106 and F-107 switches are in the OFF position.
4) AUTO: With its HAND/OFF/AUTO selector switch in the AUTO position, the system shall operate as described in this Section.

a) Normal Operation: Normal operating conditions is that F-107 is inoperative.
b) If differential pressure switch at FH-109 detects flow, then F-107 continuously runs. When differential pressure switch detects no-flow, then F-107 is deactivated.

e. FH-109 and MD-158 Operation:

1) The fume hood exhaust fan is controlled by a unit-mounted ON/OFF switch. The fan operates through its ON/OFF switch in ON position.
2) ON: With its ON/OFF switch in the ON position, MD-159 fully opens and the fume hood exhaust fan operates continuously.
3) OFF: With its ON/OFF switch in the OFF position, MD-159 fully closes and the fume hood exhaust fan is inoperative.

f. EVP-113, EVP-115, HP-114 and HP-116 Operation:

1) The system is controlled by inputs received from the programmable thermostat. The system operates through the programmable thermostat's HEAT/OFF/COOL/AUTO system setting switch. The unit's supply fan operates through the programmable thermostat's AUTO/ON fan setting switch. The system operates to maintain a set room temperature of 78 degrees Fahrenheit for cooling (adjustable) and 68 degrees Fahrenheit for heating (adjustable).
2) System Setting Switch:

a) HEAT: With programmable thermostats system setting switch in the HEAT position, the system activates heating when the room temperature falls below set point. Heating is deactivated when the set room temperature is reached. No cooling is associated with this position.
b) OFF: When the programmable thermostat's system setting switch is in the OFF position, this system and all of its components are inoperative.
c) COOL: When the programmable thermostat's system setting switch is in the COOL position, the system activates cooling

when the room temperature rises above the set point; Cooling is deactivated when the set room temperature is reached. No heating is associated with this position.

d) AUTO: When the system setting switch is in the AUTO position, the system activates heating when the room temperature falls below the set point. Heating is deactivated when the set room temperature is reached. The system activates cooling when the temperature rises above the set point. Cooling is deactivated when the set room temperature is reached.

3) Fan Setting Switch:

a) ON: When the programmable thermostat's fan setting switch is in the ON position, the fan runs continuously.

b) AUTO: When the programmable thermostat's fan setting switch is in the AUTO position, the fan runs only when the thermostat calls for heating or cooling.

g. EHC-124 and EHC-125 Operation:

1) EHC-124 and EHC-125 is controlled by a duct-mounted temperature sensor. EHC-124 and EHC-125 operate to maintain a set supply air temperature of 50 degrees Fahrenheit (adjustable).

h. EWH-142 and EWH-143 Operation:

1) The electric wall heater is controlled by its integral thermostat. The electric wall heater operates to maintain a set room temperature of 65 degrees Fahrenheit (adjustable).

5. Toilet 106:

a. System Description: Toilet 106 consists of an exhaust fan and an electric wall heater. The exhaust fan is controlled by a wall-mounted ON/OFF switch and provides ventilation. The electrical wall heater is controlled by an integral thermostat and provides space heating.

b. Equipment:

Equipment Description	Equipment No.
Toilet 106 Exhaust Fan	F-108
Toilet 106 Electric Wall Heater	EWH-141

c. F-108 Operation:

1) The exhaust fan is controlled by a wall-mounted ON/OFF switch. The fan operates through its ON/OFF switch in ON position.

2) ON: With its ON/OFF switch in the ON position, the exhaust fan operates continuously.

3) OFF: With its ON/OFF switch in the OFF position, the exhaust fan is inoperative.

d. EWH-141 Operation:

1) The electric wall heater is controlled by its integral thermostat. The electric wall heater operates to maintain a set room temperature of 60 degrees Fahrenheit (adjustable).

6. General Storage 107:

a. System Description: General Storage 107 consists of an exhaust fan and an electric unit heater. The exhaust fan is controlled by a unit-mounted ON/OFF switch and provides ventilation to the space. The electrical unit heater is controlled by an integral thermostat and provides space heating.
b. Equipment:

Equipment Description	Equipment No.
General Storage 107 Exhaust Fan	F-105
General Storage 107 Electric Unit Heater	EUH-135

c. F-105 Operation:

1) The exhaust fan is controlled by a unit-mounted ON/OFF switch. The exhaust fan operates through its ON/OFF switch in ON position.
2) ON: With its ON/OFF switch in the ON position, the exhaust fan operates continuously.
3) OFF: With its ON/OFF switch in the OFF position, the exhaust fan is inoperative.

d. EUH-135 Operation:

1) The electric unit heater is controlled by its integral thermostat. The electric unit heater operates to maintain a set room temperature of 50 degrees Fahrenheit (adjustable).

7. Wet Cake Storage 108:

a. System Description: The system consists of a supply fan, hot water heating coil, and a foul air exhaust fan. Outside air is supplied to and exhausted from the space at a rate of 6 air changes per hour. The hot water heating coil provides heating; its corresponding temperature control valve is controlled by a duct-mounted temperature sensor. The Wet Cake Storage 108 heating and ventilation system is controlled from the Biosolids Building Process Area HVAC Control Panel. There are two electric unit heaters located near the roll-up doors for perimeter space heating.

b. Equipment:

Equipment Description	Equipment No.
Biosolids Building Process Area HVAC Control Panel	HPNL-171
Wet Cake Storage 108 Motorized Damper	MD-151
Wet Cake Storage 108 Supply Fan	F-101
Wet Cake Storage 108 Hot Water Coil	HWC-121
Wet Cake Storage 108 Temperature Control Valve	TCV-181
Wet Cake Storage 108 Foul Air Fan	F-311
Wet Cake Storage 108 Electric Unit Heater 1	EUH-131
Wet Cake Storage 108 Electric Unit Heater 2	EUH-132

c. F-101, MD-151, TCV-181, and F-311 Operation:

1) Both F-101 and F-311 are controlled by a single HAND/OFF/AUTO switch located in HPNL-171. The system operates through its HAND/OFF/AUTO selector switch in HAND and AUTO position.
2) HAND: With its HAND/OFF/AUTO selector switch in the HAND position, MD-151 is fully open, both F-101 and F-301 operates continuously and bypasses all safety and operating controls.
3) OFF: With its HAND/OFF/AUTO selector switch in the OFF position, the system and all of its components are inoperative and MD-151 is fully closed.
4) AUTO: With its HAND/OFF/AUTO selector switch in the AUTO position, the system shall operate as described in this Section.

    a) Normal Operation: Normal operating conditions are MD-151 fully open and F-101 and F-311 operating continuously.
    b) Heating Operation: TCV-171 is controlled by a duct-mounted temperature sensor and shall modulate to maintain a supply air temperature set point of 50 degrees F (adjustable).
    c) If supply air temperature downstream of HWC-121 falls below 40 degrees Fahrenheit, F-101 and F 311 shut down, MD-151 fully closes, TCV-181 modulates to full flow through coil.
    d) If differential pressure switch at F-101 is activated, then F-311 shuts down and MD-151 fully closes.
    e) If differential pressure switch at F-311 is activated, then F-101 shuts down and MD-151 fully closes.
    f) If duct-mounted smoke detector for F-101 is activated, then F-101 and F-311 shuts down and MD-151 fully closes.
    g) If duct-mounted smoke detector for F-311 is activated, then F-101 and F-311 shuts down and MD-151 fully closes.

d. EUH-131 and EUH-132 Operation:

1) The electric unit heaters are controlled by its integral thermostat. The electric unit heaters operate to maintain a set room temperature of 50 degrees Fahrenheit (adjustable).

e. Alarms:

1) F-101 Dirty Filter: Provide filter differential pressure switch across F-101 filter where shown on Drawings. Alarm at HPNL-171 when it exceeds set point. Set point shall be as recommended by filter manufacturer.
2) F-101 Low Flow: Provide differential pressure switch in supply duct where shown on Drawings. When activated, alarm at HPNL-171.
3) F-311 Low Flow: Provide differential pressure switch in exhaust duct where shown on Drawings. When activated, alarm at HPNL-171.
4) F-101 Duct Smoke: Provide duct-mounted smoke detector in supply duct where shown Drawings. When activated, alarm at HPNL-171.
5) F-311 Duct Smoke: Provide duct-mounted smoke detector in foul air duct where shown on Drawings. When activated, alarm at HPNL-171.
6) Trouble Alarm: Alarm shall be part of trouble alarm specified in Section 23 09 00-3.4-A-1-e.8.

8. Biosolids Building Hot Water Pump 1 and 2:

a. System Description: The heating hot water for the Biosolids Building is provided by a duplex set of booster pumps (duty, standby) off of the main plant hot water loop. The pumps are controlled by an outside air temperature sensor.
b. Equipment:

Equipment Description	Equipment No.
Biosolids Building Heating Loop Control Panel	HPNL-173
Biosolids Building Hot Water Pump 1	HWP-185A
Biosolids Building Hot Water Pump 2	HWP-185B

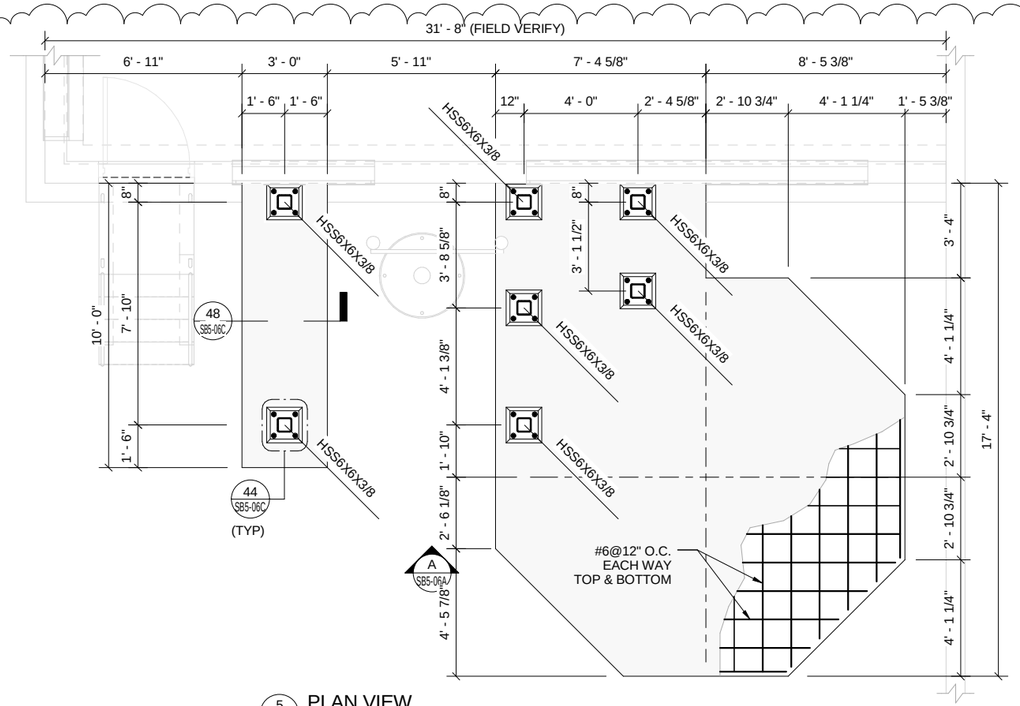
c. HWP-185A and HWP-185B Operation:

1) HWP-185A and HWP-185B are controlled by HPNL-173. The pumps operate through their “HAND/OFF/AUTO” selector switch in HAND or AUTO position.
2) HAND: With its “HAND/OFF/AUTO” selector switch in the “HAND” position, the duty pump operates continuously and bypasses all safety and operating controls.
3) OFF: With the “HAND/OFF/AUTO” selector switch in the “OFF” position, the pump, and associated components are inoperative.

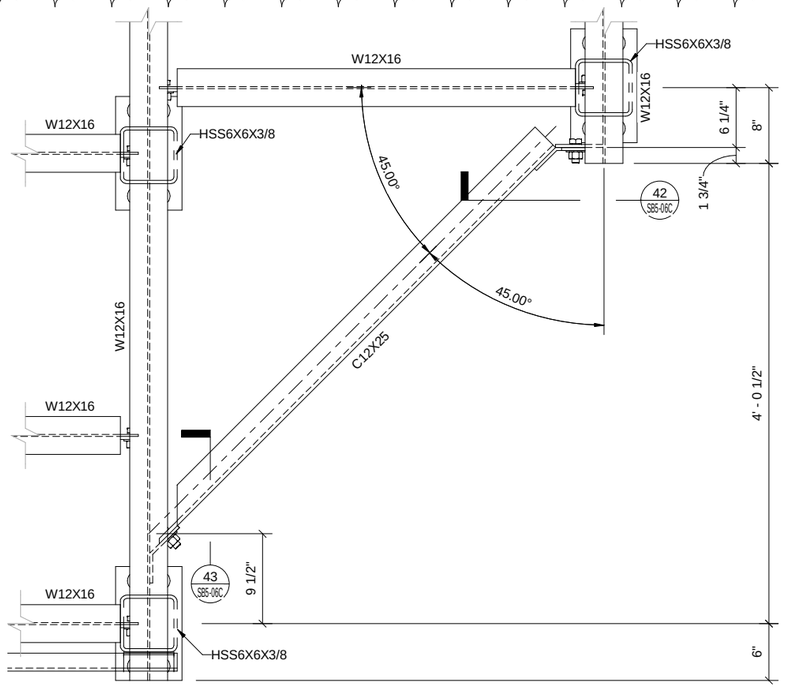
4) AUTO: With the "HAND/OFF/AUTO" selector switch in the "AUTO" position, the system shall operate as described in this Section.

a) Duty pump turns on when outside air temperature falls below 55 degrees Fahrenheit (adjustable).
b) HWP-185A and HWP-185B alternate as the duty pump each operating cycle.
c) Duty pump turns off when outside air temperature rises above 55 degrees Fahrenheit (adjustable).
d) If the duty pump does not run after a start signal is issued from HPNL-173, then the standby pump automatically runs until a stop signal is issued from HPNL-173.

END OF SECTION



5 SB5-06A **PLAN VIEW**
3/8" = 1'-0"
1 0 1 2 3 4 5 6 7
scale feet



22 SB5-06A **ENLARGED PLAN VIEW**
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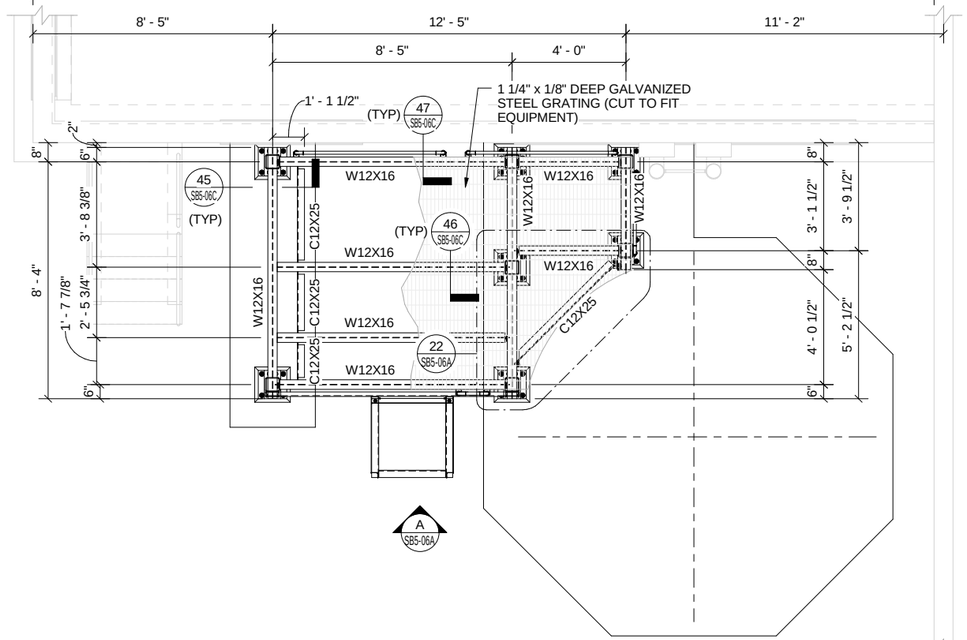
1 0 1
scale feet



6 SB5-06A **PLAN VIEW**
3/8" = 1'-0"
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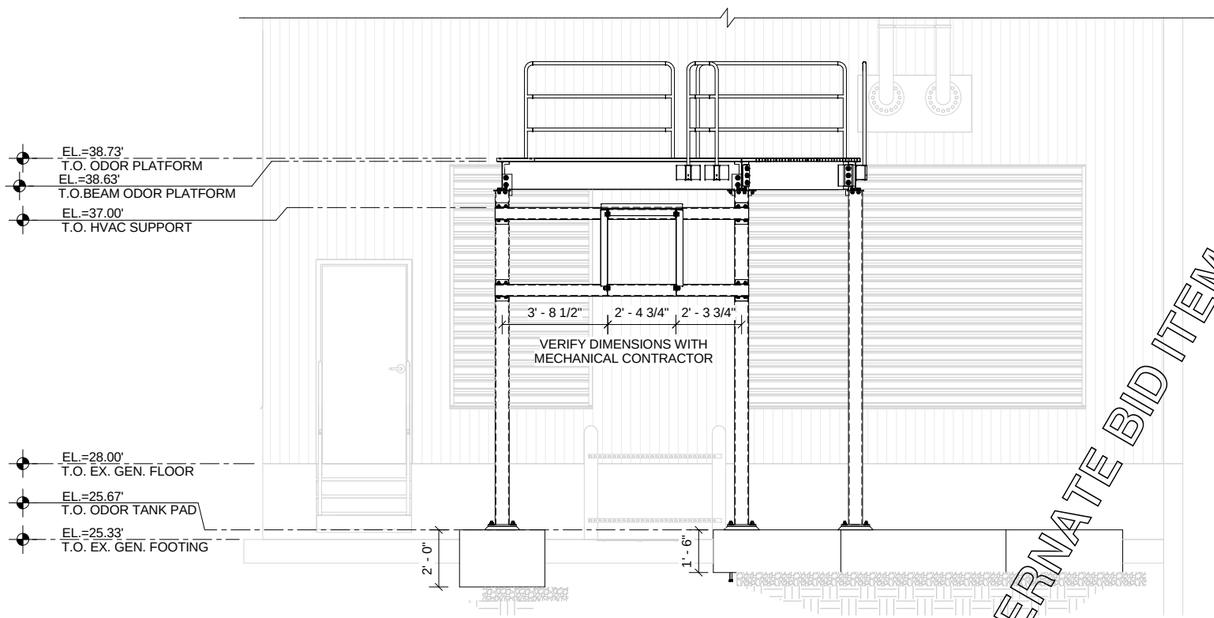
scale feet



A SB5-06A **ELEVATION - SOUTH (ALTERNATE 1)**
3/8" = 1'-0"
1 0 1 2 3 4 5 6 7
scale feet

4

ALTERNATE BID ITEM

REVISIONS

REV	DATE	DESCRIPTION	BY
1	3/01/2017	FINAL REVIEW SET	
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3	5/24/2017	BID SET-FOR CONSTRUCTION-REVISED	
4	7/05/2017	IPS ALT LAYOUT - FOR CONSTRUCTION	

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MENDENHALL WASTEWATER TREATMENT PLANT
BIO-SOLIDS DRYER FACILITY
CBJ CONTRACT No. BE17-133

STRUCTURAL
DETAILS - IPS ODOR CONTROL PLATFORM

PROJECT 1229.70862.01
DATE 05/24/2017

SHEET OF 247
SB5-06A

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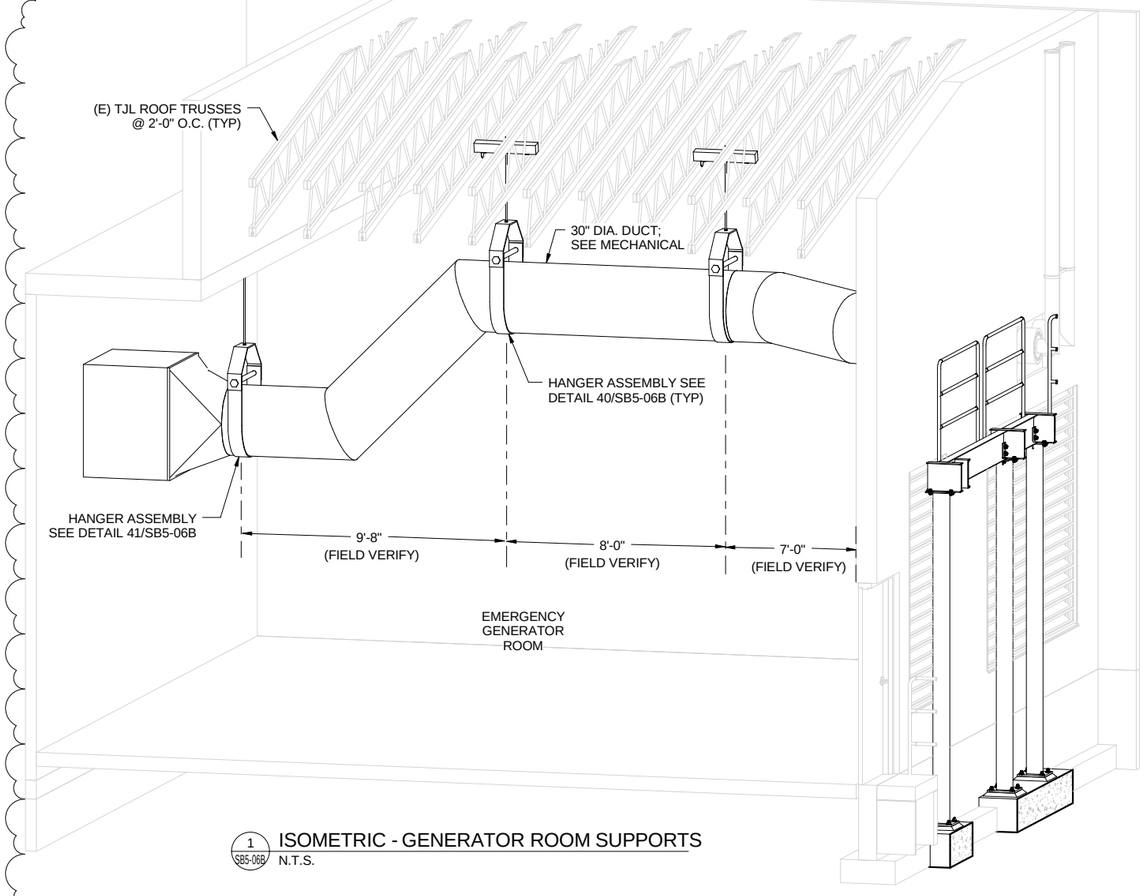
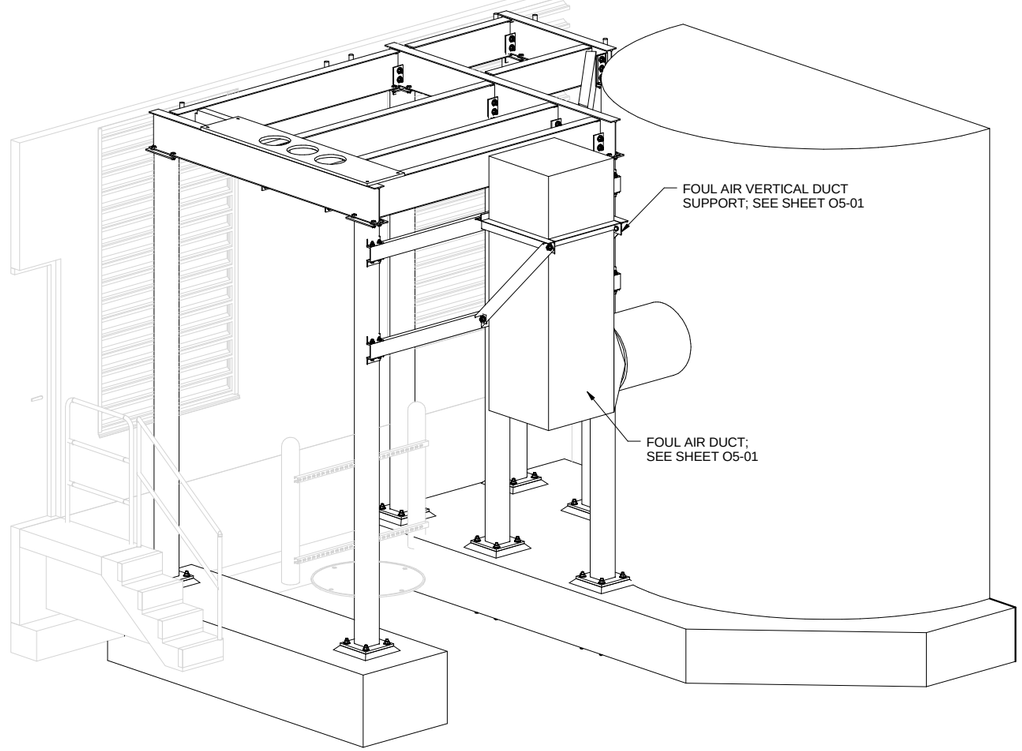


1 SB5-06B ISOMETRIC - GENERATOR ROOM SUPPORTS
N.T.S.



2 SB5-06B ISOMETRIC - PLATFORM HVAC SUPPORTS
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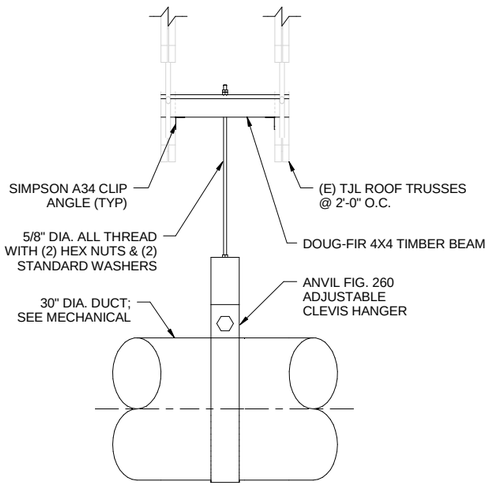

40 SB5-06B DETAIL
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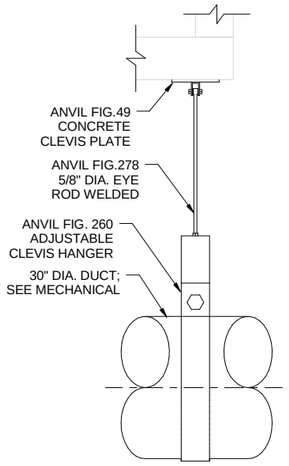
scale feet



41 SB5-06B DETAIL
3/4" = 1'-0"
1 0 1 2 3
scale feet

4 ALTERNATE BID ITEM

REVISIONS

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1	3/01/2017	FINAL REVIEW SET	
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MENDENHALL WASTEWATER TREATMENT PLANT
BIO-SOLIDS DRYER FACILITY
CBJ CONTRACT No. BE17-133

STRUCTURAL
DETAILS - IPS ODOR CONTROL SUPPORTS

PROJECT 1229.70862.01
DATE 05/24/2017

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SB5-06B

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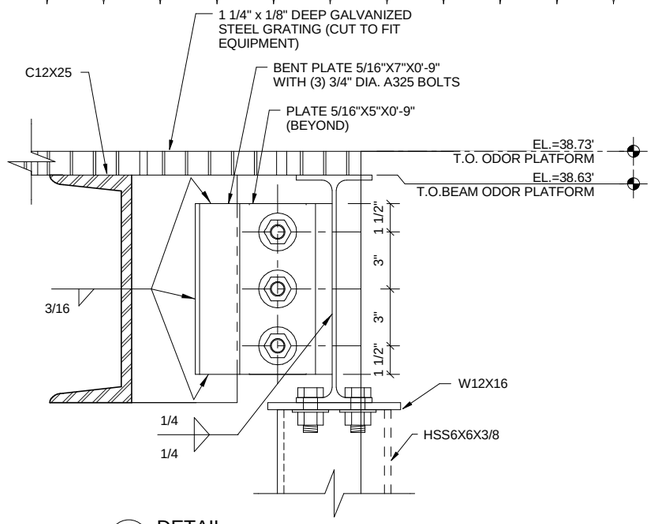

42 SB5-06C DETAIL
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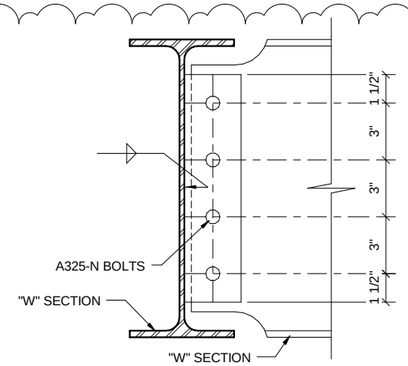
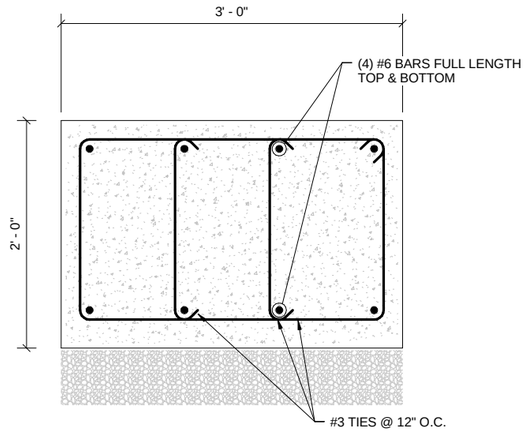
0 1
scale feet

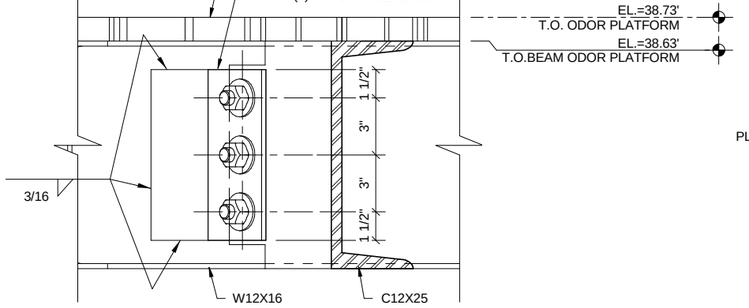


CONNECTION TYPE	NO. OF BOLTS	BOLT SIZE (INCHES)	℄ THICKNESS (INCHES)	WELD
W12X16 TO W12X16	3	3/4" DIAMETER	5/16"	1/4"

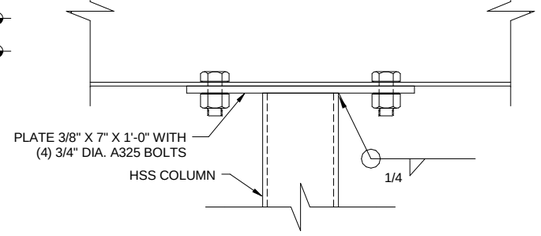
45 SB5-06C DETAIL
3" = 1'-0"
1 0 1
scale feet



48 SB5-06C DETAIL
1 1/2" = 1'-0"
1 0 1
scale feet



43 SB5-06C DETAIL
3" = 1'-0"
0 1
scale feet



46 SB5-06C DETAIL
3" = 1'-0"
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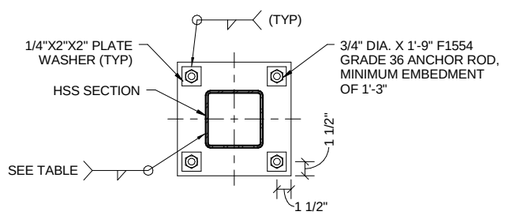
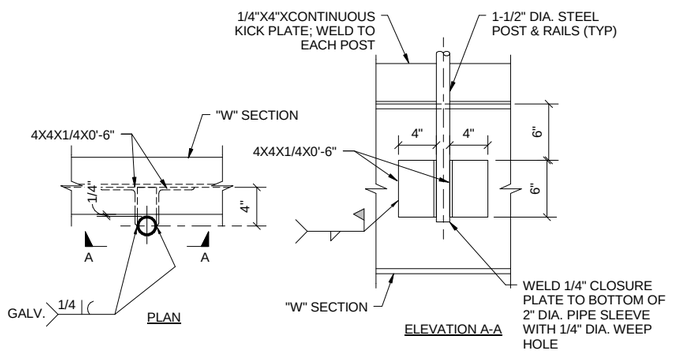
scale feet



HSS SECTION	PLATE SIZE	WELD SIZE
6X6	3/4"X12"X12"	1/4"

44 SB5-06C DETAIL
1 1/2" = 1'-0"
1 0 1
scale feet



47 SB5-06C DETAIL
1 1/2" = 1'-0"
1 0 1
scale feet

ALTERNATE BID ITEM

4

REV	DATE	DESCRIPTION	BY
1	3/01/2017	FINAL REVIEW SET	
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MENDENHALL WASTEWATER TREATMENT PLANT
BIO-SOLIDS DRYER FACILITY
CBJ CONTRACT No. BE17-133

STRUCTURAL
DETAILS - IPS ODOR CONTROL MISC.

PROJECT 1229.70862.01
DATE 05/24/2017

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SB5-06C

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ELECTRIC DUCT HEATER SCHEDULE

EQUIPMENT NO	NAME	LOCATION	TYPE	AIRFLOW (CFM)	ESP (IN WC)	ELECTRICAL REQUIREMENTS		DIMENSIONS		WEIGHT (LBS)	NOTES
						KW	VOLTS/PHASE	WIDTH (IN)	HEIGHT (IN)		
EHC-123	THERMAL FLUID 102 ELECTRIC HEATING COIL	THERMAL FLUID 102	TUBULAR FINNED	1,525	0.19	22	460/3	20	20	250	1
EHC-124	OFFICE/CONTROL ROOM 201 ELECTRIC HEATING COIL	LANDING 202	OPEN COIL	100	0.01	1.25	460/3	8	8	60	1
EHC-125	LAB 105 ELECTRIC HEATING COIL	LANDING 202	OPEN COIL	870	0.04	18	460/3	16	16	200	1

NOTES:
1. PROVIDE WITH SCR CONTROL THAT IS CAPABLE OF 0 TO 100% HEATING CONTROL.

HOT WATER HEATING COIL SCHEDULE

EQUIPMENT NO	NAME	LOCATION	TYPE	HEATING CAPACITY (BTUH)	AIRFLOW (CFM)	APD (IN WC)	FLUID TYPE	FLUID FLOW (GPM)	FPD (FT H20)	TEMPERATURE REQUIREMENTS (F)				ROWS / FPI	DIMENSIONS		ASSOCIATED CONTROL VALVE	NOTES
										EADB	LADB	EFT	LFT		WIDTH (IN)	HEIGHT (IN)		
HWC-121	WET CAKE STORAGE 108, OBSERVATION 109, BELT PRESS 203 HOT WATER HEATING COIL	OBSERVATION 109	HOT WATER	525,480	8,815	0.20	50% ETHYLENE	30.2	10.7	7	55.4	190	150	2 / 6	44	45	TCV-181	
HWC-122	DRYER ROOM 101 HOT WATER HEATING COIL	DRYER ROOM 101	HOT WATER	563,682	9,565	0.21	50% ETHYLENE	32.4	12.5	7	54.9	190	150	2 / 6	46	45	TCV-182	

TEMPERATURE CONTROL VALVE SCHEDULE

EQUIPMENT NO.	NAME	LOCATION	TYPE	VALVE SIZE (IN)	LINE SIZE (IN)	NORMAL FLOW (GPM)	TEMP. RANGE (F)	CV	PRESSURE DROP (PSIG)	VOLTS/ PHASE	NOTES
TCV-181	WET CAKE STORAGE 108, OBSERVATION 109, BELT PRESS 203 TEMPERATURE CONTROL VALVE	OBSERVATION 109	3-WAY, MODULATION	1	1 1/2	30.2	150-190	65.1	4.64	208/3	4
TCV-182	DRYER ROOM 101 TEMPERATURE CONTROL VALVE	DRYER ROOM 101	3-WAY, MODULATION	1	1 1/2	32.4	150-190	75.4	5.42	208/3	

HOT WATER PUMP SCHEDULE

EQUIPMENT NO.	NAME	LOCATION	TYPE	FLOW RATE (GPM)	TOTAL HEAD (FT)	ELECTRICAL REQUIREMENTS					WEIGHT (LBS)	NOTES
						MOTOR HP	MOTOR RPM	VOLTS/ PHASE	MOTOR ENCLOSURE	FLA		
HWP-185A	BIOSOLIDS BUILDING HOT WATER PUMP NO. 1	SBR BUILDING BOILERS 107	IN-LINE	73.8	24.7	3/4	1750	480/3	TEFC	1.6	150	
HWP-185B	BIOSOLIDS BUILDING HOT WATER PUMP NO. 2	SBR BUILDING BOILERS 107	IN-LINE	73.8	24.7	3/4	1750	480/3	TEFC	1.6	150	

REVISIONS

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STATE OF ALASKA 49TH
ZIMRI MOORE
No. AELC9164
REGISTERED PROFESSIONAL ENGINEER
07/05/2017

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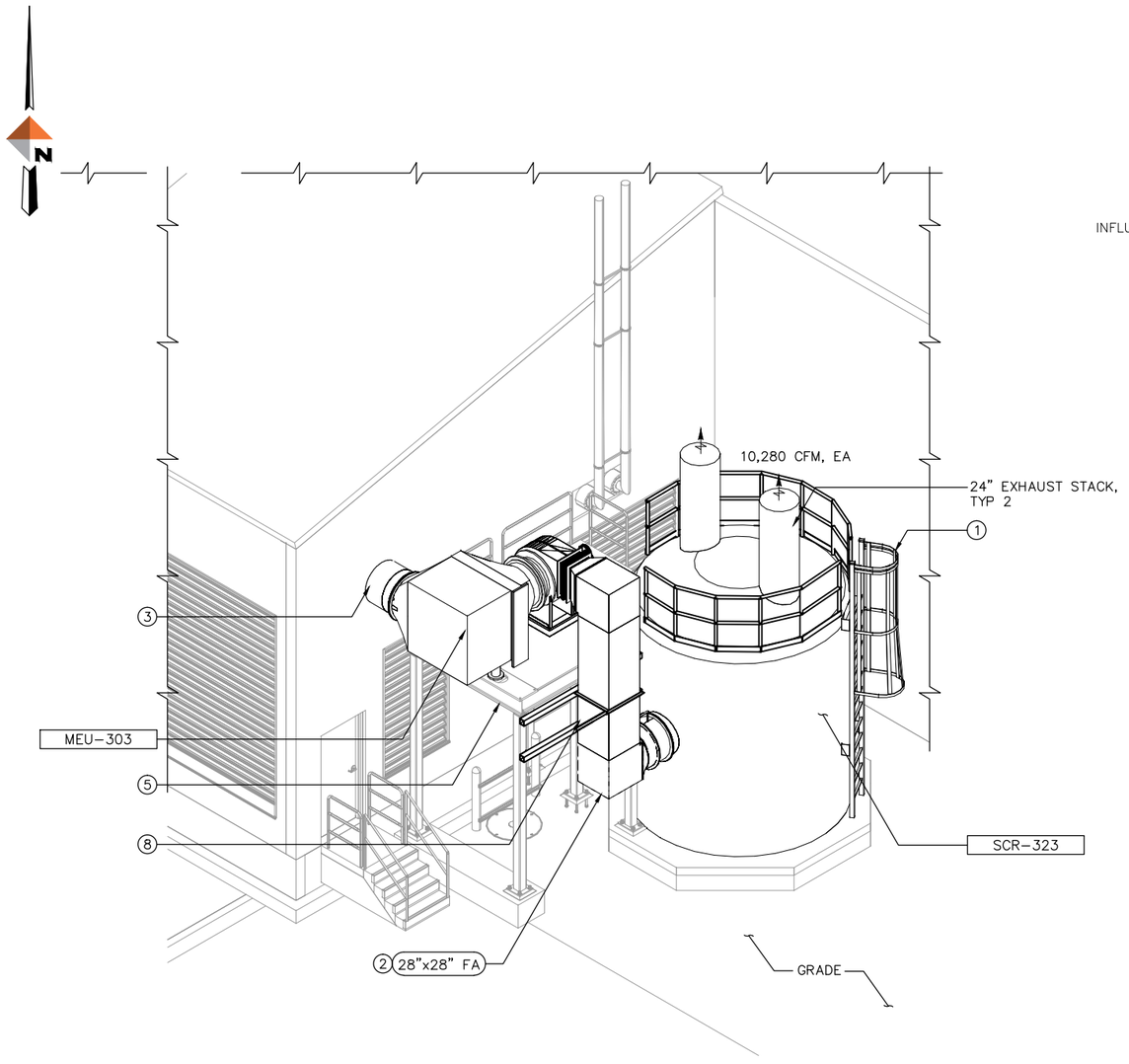
MENDENHALL WASTEWATER TREATMENT PLANT
BIOSOLIDS DRYER FACILITY
CBJ CONTRACT No. BE17-133

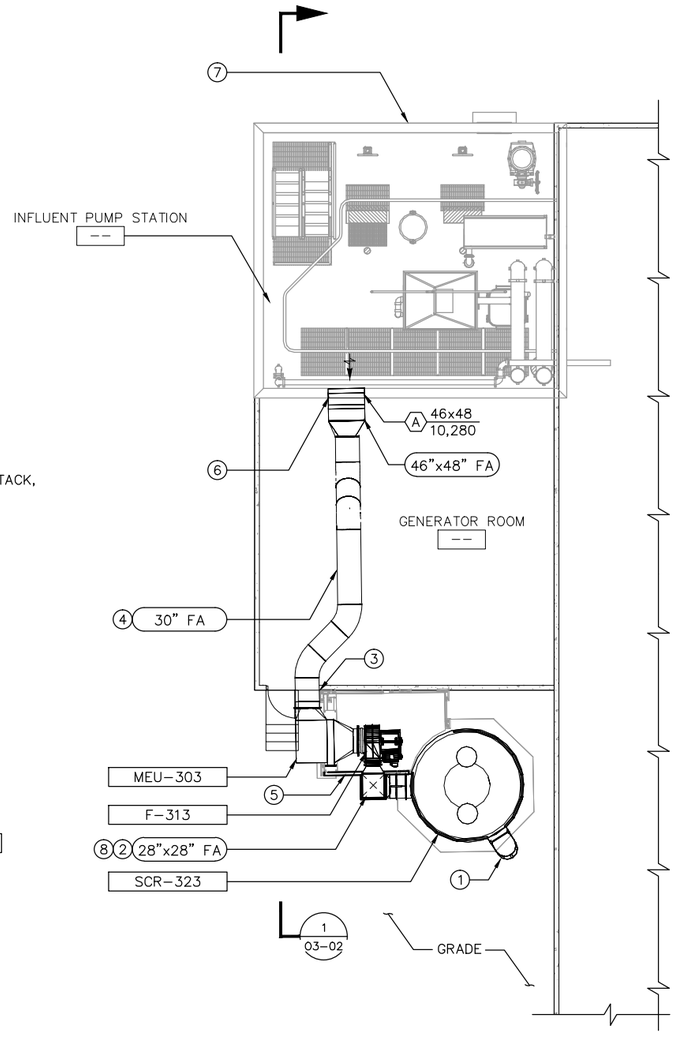
HVAC
EQUIPMENT SCHEDULES 3

PROJECT 1229.70862.01
DATE 05/24/2017

MH6-03



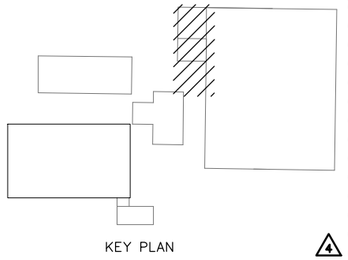
INFLUENT PUMP STATION ISOMETRIC
SCALE: N.T.S.



INFLUENT PUMP STATION
SCALE: 1/8" = 1'-0"

KEY NOTES:

1. ACCESS LADDER TO TOP OF SCRUBBER AND PLATFORM.
2. PROVIDE EXTERIOR WRAP INSULATION FOR EXTERIOR FOUL AIR DUCT.
3. SEE DETAIL C/SHEET 05-01 FOR FOUL AIR DUCT WALL PENETRATION.
4. CONTRACTOR SHALL FIELD VERIFY ROUTING TO ENSURE CLEAR PATH FOR FOUL AIR DUCT. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MODIFICATIONS REQUIRED TO EXISTING PIPE AND CONDUIT ROUTING, AND EQUIPMENT LOCATIONS.
5. EQUIPMENT PLATFORM, SEE STRUCTURAL FOR MORE INFORMATION.
6. SEE DETAIL B/SHEET 05-01 FOR FOUL AIR DUCT INTERIOR WALL PENETRATION.
7. CONTRACTOR SHALL PERMANENTLY DEACTIVATE EXISTING EXHAUST FAN, LOCATED INSIDE EXTERIOR EXHAUST STACK, AND ABANDON IN PLACE; BLANK-OFF EXISTING EXHAUST OPENING INSIDE THE INFLUENT PUMP STATION.
8. SEE DETAIL D/SHEET 05-01 FOR FOUL AIR DUCT SUPPORT.



KEY PLAN

0 4' 8' 16'
Scale: 1/8" = 1'-0"

ALTERNATE BID ITEM

REVISIONS

REV	DATE	DESCRIPTION	BY
1	3/01/2017	FINAL REVIEW SET	
2	4/27/2017	BID SET - FOR CONSTRUCTION	
3	5/24/2017	BID SET - FOR CONSTRUCTION - REVISED	
4	7/5/2017	IPS ALT LAYOUT - FOR CONSTRUCTION	

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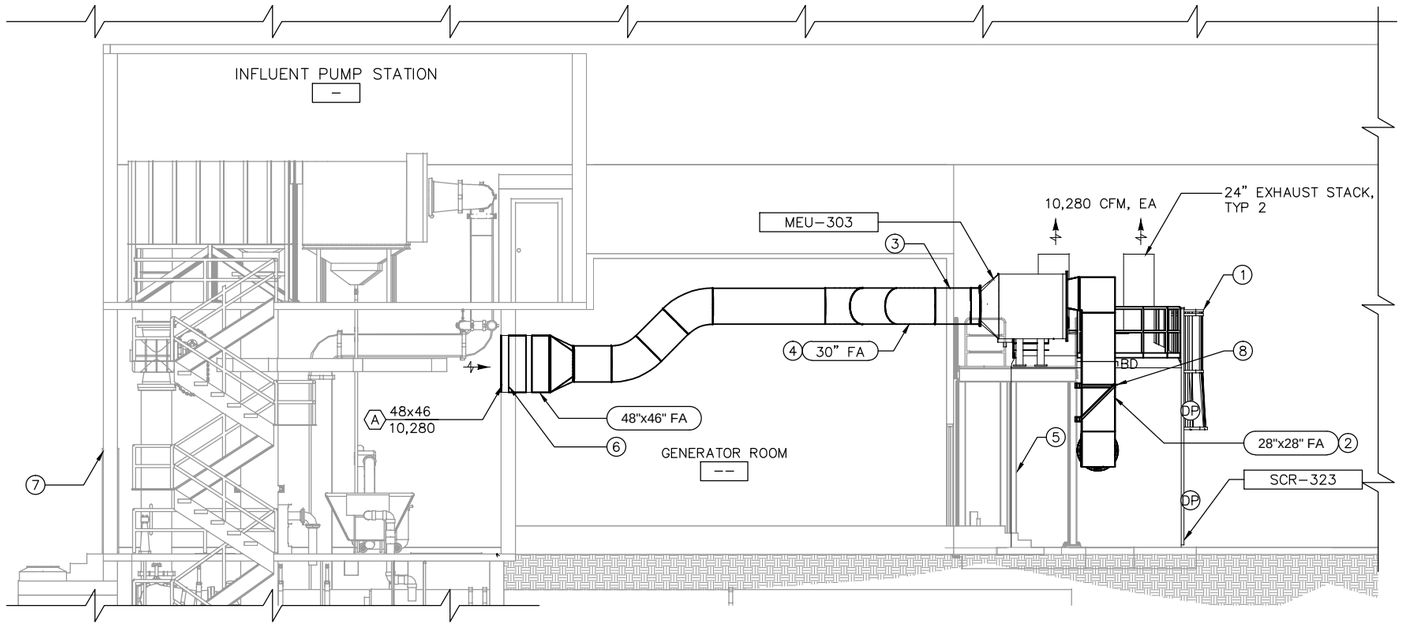
ODOR CONTROL
INFLUENT PUMP STATION PLAN

PROJECT 1229.70862.01
DATE 05/24/2017

SHEET 177 OF 247
O1-03



SECTION 1 / 01–03

SCALE: 3/16"=1'–0"

KEY NOTES:

1. ACCESS LADDER TO TOP OF SCRUBBER AND PLATFORM.
2. PROVIDE EXTERIOR WRAP INSULATION FOR EXTERIOR FOUL AIR DUCT.
3. SEE DETAIL C/SHEET 05–01 FOR FOUL AIR DUCT WALL PENETRATION.
4. CONTRACTOR SHALL FIELD VERIFY ROUTING TO ENSURE CLEAR PATH FOR FOUL AIR DUCT. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MODIFICATIONS REQUIRED TO EXISTING PIPE AND CONDUIT ROUTING, AND EQUIPMENT LOCATIONS.
5. EQUIPMENT PLATFORM, SEE STRUCTURAL FOR MORE INFORMATION.
6. SEE DETAIL B/SHEET 05–01 FOR FOUL AIR DUCT INTERIOR WALL PENETRATION.
7. CONTRACTOR SHALL PERMANENTLY DEACTIVATE EXISTING EXHAUST FAN, LOCATED INSIDE EXTERIOR EXHAUST STACK, AND ABANDON IN PLACE; BLANK–OFF EXISTING EXHAUST OPENING INSIDE THE INFLUENT PUMP STATION.
8. SEE DETAIL D/SHEET 05–01 FOR FOUL AIR DUCT SUPPORT DETAIL.

ALTERNATE BID ITEM

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BIOSOLIDS DRYER FACILITY
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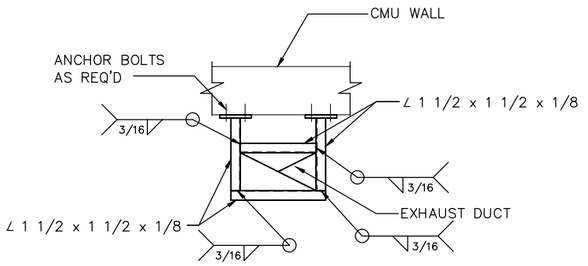
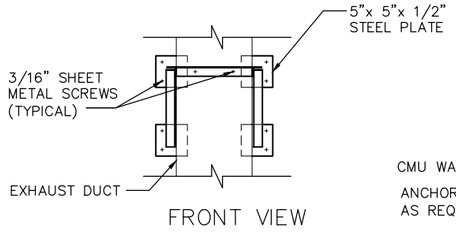
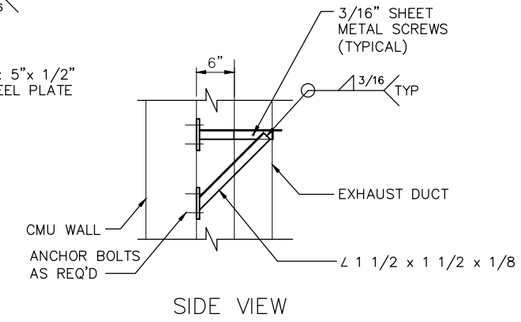
ODOR CONTROL SECTIONS 2

PROJECT 1229.70862.01
DATE 05/24/2017

O3-02



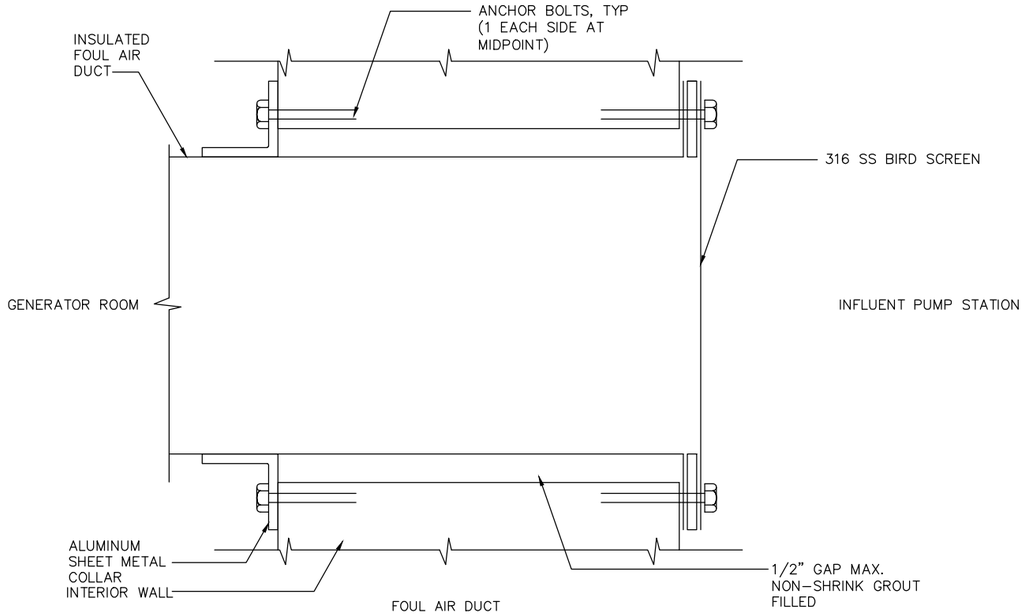




CONDENSATE DRAIN TRAP

DETAIL A VAR

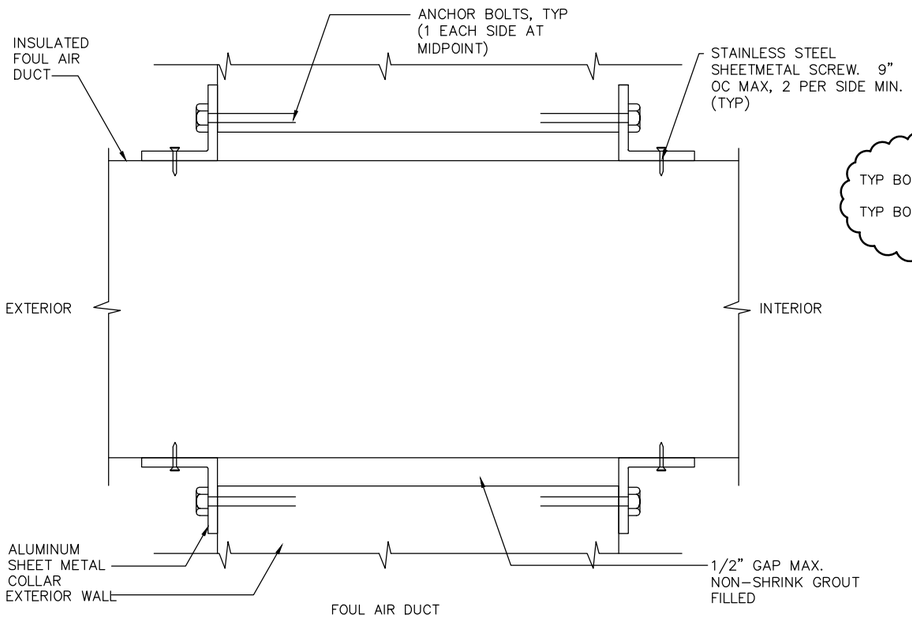
SCALE: NONE



FOUL AIR DUCT
INTERIOR WALL PENETRATION

DETAIL B VAR

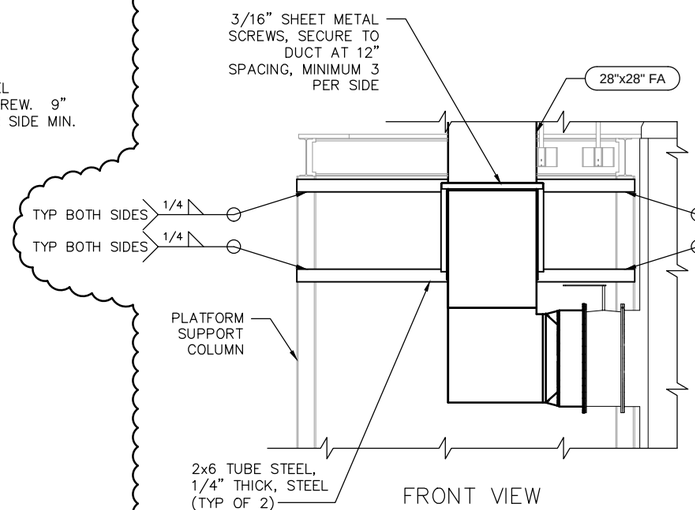
SCALE: NONE

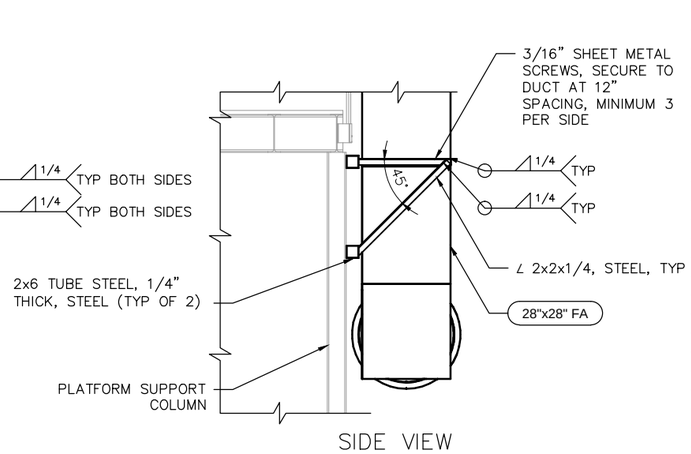


FOUL AIR DUCT
WALL PENETRATION

DETAIL C VAR

SCALE: NONE





FOUL AIR DUCT
VERTICAL DUCT SUPPORT

DETAIL D VAR

SCALE: NONE

4

REVISIONS

REV	DATE	DESCRIPTION	BY
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ODOR CONTROL DETAILS

PROJECT 1229.70862.01
DATE 05/24/2017

SHEET 180 OF 247

O5-01

MIST ELIMINATOR UNIT SCHEDULE

EQUIPMENT NO.	NAME	LOCATION	TYPE	CAPACITY (CFM)	SP (IN WC)	INLET CONNECTION SIZE, (INCHES)	DROPLET REMOVAL EFFICIENCY	NOTES
MEU-301	WET CAKE STORAGE 108, OBSERVATION 109, BELT PRESS 203 MIST ELIMINSTOR	SOUTH SIDE, EXTERIOR	FRP, ELBOW TYPE	9,700	1.50	30	99% > 10 MICRONS	
MEU-302	DRYER ROOM 101 MIST ELIMINATOR	SOUTH SIDE, EXTERIOR	FRP, ELBOW TYPE	11,115	1.50	30	99% > 10 MICRONS	
MEU-303	INFLUENT PUMP STATION MIST ELIMINATOR	SOUTH SIDE, EXTERIOR	FRP, ELBOW TYPE	10,280	1.50	30	99% > 10 MICRONS	1,2

NOTES:
1. ALTERNATIVE BID ITEM. 4

FRP FAN SCHEDULE

EQUIPMENT NO.	NAME	LOCATION	TYPE	AIRFLOW REQUIREMENTS			ORIENTATION		ELECTRICAL REQUIREMENTS							WEIGHT (LBS)	NOTES
				AIRFLOW (CFM)	ESP (IN WC)	FRPM	ROTATION	DISCHARGE	MOTOR (BHP)	MOTOR SIZE (HP)	VOLTS/ PHASE	MOTOR ENCLOSURE	DRIVE TYPE	VFD	FLA		
F-311	WET CAKE STORAGE 108, OBSERVATION 109, BELT PRESS 203 FOUL FAN	SOUTH SIDE, EXTERIOR	CENTRIFUGAL FRP	9,700	10.00	2,260	CCW	TH	21.50	25	460/3	EXP	BELT	NO	34	1,500	1
F-312	DRYER ROOM 101 FOUL AIR FAN	SOUTH SIDE, EXTERIOR	CENTRIFUGAL FRP	11,115	10.00	1,773	CCW	TH	23.90	25	460/3	TEFC	BELT	NO	34	1,500	1
F-313	INFLUENT PUMP STATION FOUL AIR FAN	SOUTH SIDE, EXTERIOR	CENTRIFUGAL FRP	10,280	10.00	2,311	CCW	TH	23.10	25	460/3	EXP	BELT	NO	34	1,500	1,2

NOTES:
1. SEE FRP FAN SOUND SCHEDULE FOR SOUND POWER REQUIREMENTS.
2. ALTERNATIVE BID ITEM. 4

FRP FAN SOUND POWER LEVELS

EQUIPMENT NO.	OCTAVE BAND CENTER FREQUENCY, HZ									HOUSING RADIATED NOISE, (dBA)	NOTES
	63	125	250	500	1000	2000	4000	8000	OVERALL		
F-311	97.6	95.6	103.6	96.4	90.4	92.4	92.4	82.4	106.2	79.2	1
F-312	98.8	99.8	99.8	94.8	90.2	89.8	88.2	83.2	105.2	75.4	1
F-313	98.8	99.8	99.8	94.8	90.2	89.8	88.2	83.2	105.2	75.4	1,2

NOTES:
1. HOUSING RADIATED NOISE IS THE ESTIMATED SOUND PRESSURE LEVEL AT 5 FEET DISTANCE OUTSIDE THE FAN WHEN BOTH INLET AND OUTLET ARE DUCTED.
2. ALTERNATIVE BID ITEM. 4

CARBON SCRUBBER SCHEDULE

EQUIPMENT NO.	NAME	LOCATION	TYPE	PERFORMANCE REQUIREMENTS			MEDIA REQUIREMENTS							PHYSICAL REQUIREMENTS				NOTES
				CAPACITY (CFM)	SP (IN WC)	FACE VELOCITY (FPM)	MEDIA TYPE	BED DEPTH, (FEET)	MEDIA VOLUME, (CUBIC FEET)	MIN. PELLET DIAMETER	MIN. H2S ADSORPTION CAPACITY	MAX. MOISTURE CONTENT	MIN. BUTANE ADSORPTION	TANK DIAMETER, (FEET)	INLET SIZE, (INCHES)	EXHAUST SIZE, (INCHES)	WEIGHT (LBS)	
SCR-321	WET CAKE STORAGE 108, OBSERVATION 109, BELT PRESS 203 CARBON SCRUBBER	SOUTH SIDE, EXTERIOR	FRP, VERTICAL DUAL-BED	9,700	4.30	43.82	HIGH CAPACITY CARBON	3	664.2	4-mm	0.3 g/cc	15%	23.5%	12.00	30	20	40,000	1
SCR-322	DRYER ROOM 101 CARBON SCRUBBER	SOUTH SIDE, EXTERIOR	FRP, VERTICAL DUAL-BED	11,115	4.90	50.67	HIGH CAPACITY CARBON	3	658.1	4-mm	0.3 g/cc	15%	23.5%	12.00	30	24	40,000	1
SCR-323	INFLUENT PUMP STATION CARBON SCRUBBER	SOUTH SIDE, EXTERIOR	FRP, VERTICAL DUAL-BED	10,280	5.00	45.45	HIGH CAPACITY CARBON	3	658.1	4-mm	0.3 g/cc	15%	23.5%	12.00	30	24	40,000	1,2

NOTES:
1. REFERENCE SECTION 44 31 17 FOR MORE INFORMATION ON HIGH CAPACITY CARBON MEDIA.
2. ALTERNATIVE BID ITEM. 4

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ODOR CONTROL EQUIPMENT SCHEDULES

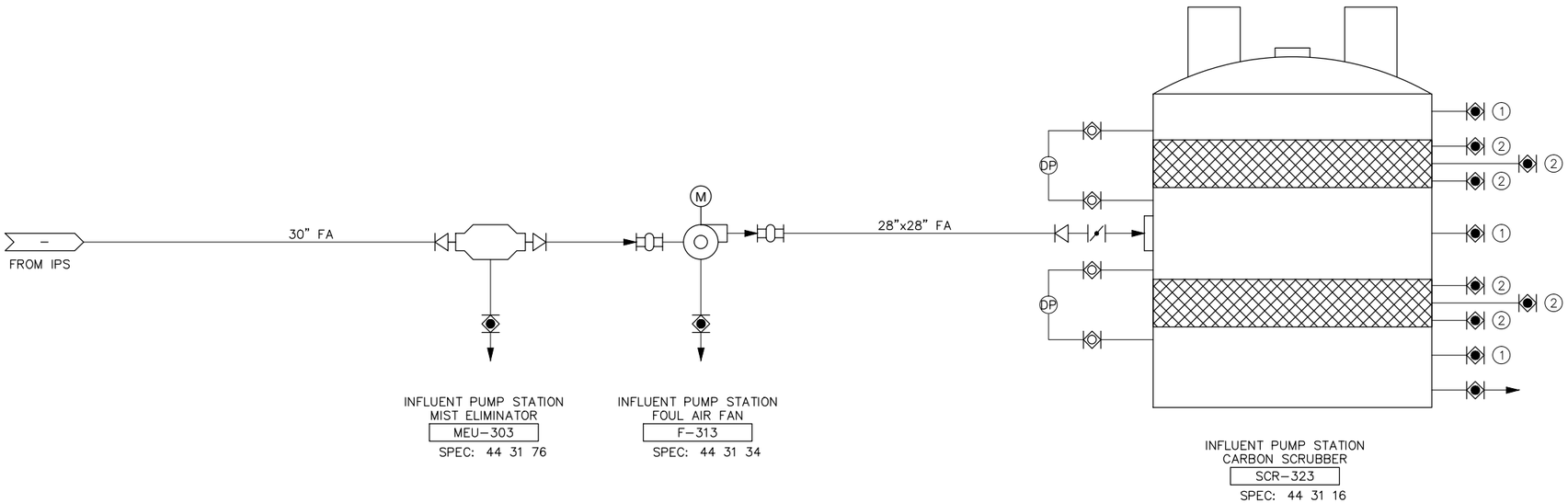
PROJECT 1229.70862.01
DATE 05/24/2017

SHEET 181 OF 247

O6-01

KEY NOTES:

1. AIR SAMPLE PORT.
2. CARBON SAMPLE PORT.



ALTERNATE BID ITEM

4

REVISIONS			
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ODOR CONTROL
INFLUENT PUMP STATION P&ID

PROJECT 1229.70862.01
DATE 05/24/2017

SHEET 184 OF 247

O6-04